

ABSTRACT OF THE DISCLOSURE

A layered membrane or membrane electrode assembly for use with a direct oxidation fuel cell provides reduced water carryover and fuel crossover while maintaining a high total protonic exchange between anode and cathode. A layer of material which is substantially impermeable to water and fuel, but which is foraminous to allow contact
5 between adjacent protonically conductive layers, is used to significantly increase the system's carryover resistance while only modestly increasing the total reaction resistance.